TAURINE: AN ENERGY “DRINK” FOR DEEP SEA MICROBES

The wide use of –omics approaches has led to the discovery of novel metabolic pathways in uncultivated marine bacteria. For example, metagenomic and –proteomic studies revealed that taurine might be an important substrate for heterotrophic marine bacteria. Taurine, an organic acid, is widely produced by marine metazoans and some phytoplankton albeit its concentration and turnover in the ocean has not been determined yet. In this study, we determined the role of taurine as carbon and energy source throughout the water column of the open North Atlantic from the epipelagic to the bathypelagic realm. Bulk uptake and respiration of taurine were measured and microautoradiography was combined with catalyzed reporter deposition fluorescence in situ hybridization to evaluate taurine uptake by specific phylogenetic groups. A shift between the dominant use of taurine as a carbon source from the epi- and mesopelagic (about 40% of taurine respired) to the bathypelagic (76% respired) realm was observed. Taken together, our results indicate that taurine is effectively used by marine prokaryotes, especially in the mesopelagic environment where zooplankton, a potential source for taurine, reside during the day.